REMARKS

Rejections under 35 U.S.C § 103(a)

Claims 1-9, 11 and 16-21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over French patent 2,794,686 ("FR Abinal") in view of U.S. Patent No. 5,202,363 ("Oberster"), U.S. Patent No. 4,929,684 ("Roland") and U.S. Patent No. 6,051,653 ("McElrath"). As the Examiner has noted, U.S. Patent No. 6,564,842 ("Abinal") is related to FR Abinal and all references in the remarks below refer to this related case.

Applicant claims a support for mounting on a wheel rim inside a vehicle tire, wherein the support has a composition consisting essentially of, *inter alia*, rubber and from 5 to 70 parts of a metal salt of an unsaturated carboxylic acid based on 100 parts of the rubber, wherein the composition is cured with a peroxide curing agent. (Claims 1 and 21).

Applicant discloses that the rubber used in the claimed composition may be a dienic unsaturated elastomer such as natural rubber, polyisoprene, polybutadiene and styrene-butadiene rubber as well as copolymers of butyl acrylonitrile and copolymers of butyl paramethyl styrene. (*See*, Specification, p. 6, lines 2-6). Applicant further discloses that these rubbers are curable with a metal salt of a carboxylic acid and a peroxide cure system. *Id.*

Applicant has disclosed that the desired properties of claimed support having the claimed composition include less hysteresis than the conventional filled rubber compounds (*See*, Specification, p. 9, lines 1-2) and improved thermo-oxidative stability to endure the harsh oxidizing conditions of the operating environment of the claimed support (*See*, Specification, p. 9, lines 12-21). The reduced hysteresis is an important property of the claimed support because it allows the support to run at a cooler temperature when operating in the run flat mode. (*See*, Specification, p. 9, lines 1-4). The results obtained under testing of the claimed material show an increased modulus over compounds without the addition of the unsaturated carboxylic acid, ranging from 16-55 MPa with the additive and 12 without the additive. (*See*, Specification, p. 16, Table 2). Furthermore, the claimed material showed a decrease in the hysteresis as measured by tan δ @ 40° C, 10% shear and @100° C, 10% shear. The tan δ @ 40° C, 10% shear was 0.16 for the conventional material while ranging between 0.041 and 0.07 for the claimed material. *Id.* Likewise, the tan δ @ 100° C, 10% shear was

0.079 for the conventional material while ranging between 0.040 and 0.045 for the claimed material. *Id.* These results show the significant reduction in the hysteresis of the claimed support versus a support made of a conventional material.

While it is known that adding a unsaturated carboxylic acid to a rubber blend will increase the modulus of the resulting product, the resultant concurrent decrease in hysteresis of the claimed support as disclosed by Applicant in the specification was a surprising result and not known by those having ordinary skill in the art.

To establish a *prima facie* case of obviousness of a claimed invention, the Examiner must provide a basis for combining or modifying the cited references. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990).

In the case *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998), the Court states:

> When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. *Although the suggestion to combine references may flow from the nature of the problem, the suggestion more often comes from the teachings of the pertinent references or from the ordinary knowledge of those skilled in the art that certain references are of special importance in a particular field.* Therefore, when determining the patentability of a claimed invention which combines two known elements, *the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.*

Id. at 1356 [citations omitted] [Emphasis added].

In the case *In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002), the Federal Circuit held:

> When patentability turns on the question of obviousness, the search for and analysis of the prior art includes *evidence* relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness.

Id. at 1343, emphasis added.

Applicant asserts that a *prima facie* case of obviousness has not been presented because the Examiner has not provided *evidence* of the motivation or desirability, and thus the obviousness, of making the combination.

The Abinal reference cited by the Examiner discloses a support used in a run flat system. (Abinal, Abstract). Abinal discloses that one suitable material for making the support is a natural or synthetic rubber-based compound having a modulus of between 8 and 30 MPa. (Abinal, col. 3, lines 26-30). However, as the Examiner states, Abinal fails to suggest the inclusion of a metal salt and a peroxide in the composition of the material used in Applicant's claimed support. (*See*, Office Action, p. 2. ¶ 2).

The Examiner therefore includes three additional secondary references (Oberster, Roland, and McElrath) that teach adding a carboxylic acid to a rubber blend to support the Examiner's conclusion that adding a carboxylic acid and peroxide to a rubber compound is well known and therefore, one having ordinary skill in the art would have found it obvious to include the claimed additives *since the benefits are consistent with the desired properties of a tire support*. (*See*, Office Action, pp. 2-3, ¶ 2) [Emphasis added].

Applicant respectfully disagrees with this conclusion and asserts that the references cited by the Examiner *do not teach or suggest the benefit of the decreased hysteresis found in Applicant's claimed invention*. Therefore, Applicant respectfully asserts there is no motivation to combine the cited prior art references.

The first secondary reference cited by the Examiner is Oberster. Oberster discloses that adding metal salts to a rubber blend may improve tensile strength and modulus. (Oberster, col. 1, lines 5-15). Oberster further discloses that a peroxide may be used to cure the product. (Oberster, col. 5, lines 27-35). Oberster further discloses that the modulus and tensile values are the properties of the rubber compounds that are improved with the addition of the metal salt. (Oberster, col. 6, lines 35-40). However, Applicant is unable to find any disclosure or teaching by Oberster of *decreased hysteresis*. Oberster merely teaches and discloses that which is well known in the art – that the addition of a carboxylic acid will increase modulus. Oberster was trying to solve the problem of how to increase modulus and tensile strength of a rubber product and found a solution to that problem.

The second secondary reference cited by the Examiner is Roland. Roland discloses a material for use in making stiff sidewalls for pneumatic tires to solve problems associated with the handing and performance of a tire, especially during cornering. (Roland, Abstract). Like Oberster, Roland merely teaches that adding carboxylic acid to the rubber mix will increase the static tensile modulus or stiffness. (Roland, col. 1, lines 25-30). As the Examiner points out, Roland further cites prior art that shows that rubbers having carboxylic acids added to the mix and cured with peroxide may exhibit improved stress-strain properties. (Roland, col. 2, lines 3-11). Roland seeks to make a composition having a high modulus, from 30-200 MPa and therefore adds the carboxylic acid to make a very stiff composition. However, there is no teaching or suggestion by Roland of any action that can be taken to decrease hysteresis.

The third secondary reference cited by the Examiner is McElrath. McElrath discloses a very limited composition, BIMS rubber, made up of copolymers that are devoid of ethylenic unsaturation. (McElrath, col. 1, lines 55-60). However, McElrath also teaches that which is well known – that a combination of zinc salt of acrylic or methacrylic acid and an organic peroxide may be used to cure rubber compositions containing saturated or unsaturated elastomer compositions and blends thereof. (McElrath, col. 1, lines 20-25). Again, as with the other secondary references cited by the Examiner, none teach or suggest any means for decreasing the hysteresis.

Applicant respectfully asserts that there is no motivation to combine the cited secondary references with the cited primary reference. Each of the cited secondary references teach that a carboxylic acid may be added to a rubber system to increase the modulus or stiffness of the resulting rubber product. None of these cited prior art references are concerned with run flat tire systems and the desired property of decreasing hysteresis in such systems so that the system will not run hot in the run flat mode of operation.

As the *Roffet* court taught, the motivation to combine references may flow from (1) the nature of the problem to be solved; (2) the teachings of the references themselves, or (3) from the knowledge of those skilled in the art that certain references are of special importance in a particular field. *In re Rouffet*, 149 F.3d at 1356.

(1) None of the secondary references address the problem sought to be solved by Applicant – reducing the hysteresis in a run flat tire system. Instead, each of the cited prior art references merely sought to increase the modulus or stiffness of a rubber product.

(2) The teachings of the references themselves do not include any mention of hysteresis or how to reduce hysteresis. Therefore, there is no suggestion from the prior art themselves to provide a motivation to combine them and solve the problem sought to be solved by Applicant – reducing hysteresis in a support component of a run flat tire system.

(3) There is no evidence that one having ordinary skill in the art would have knowledge that any of the cited prior art references are of any special importance in a particular field.

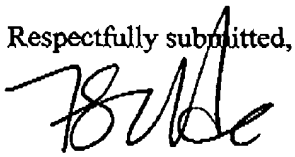
Therefore, Applicant respectfully asserts that there is no motivation to combine these cited prior art references because none teach how to decrease hysteresis, which is an important characteristic of any support in a run flat tire system. *The cited prior art references are silent as to how to decrease hysteresis so there would be no expectation of success in modifying the composition of Abinal to include the combination of a metal salt and a peroxide-curing agent.*

Indeed, more on point as a prior art reference is U.S. Patent No. 5,494,091 ("Freeman"), which was not cited by the Examiner. Freeman discloses a rubber compound having low hysteresis for run flat systems. (Freeman, Abstract). The rubber system disclosed by Freeman includes adding an unsaturated carboxylic acid but is cured with sulfur. *Id.* Indeed, Freeman specifically teaches that *a peroxide may not be used to cure the disclosed system or otherwise a mass will be rendered that is unsuitable for the manufacture of the desired rubber component.* (Freeman, col. 9, lines 7-16).

Therefore, the prior art that is more relevant to run flat systems, a component of which Applicant claims, teaches that *a peroxide may not be used* to cure a rubber compound that is suitable for use in a run flat system. Applicant has invented a support for a run flat tire system that is made of a rubber composition that the prior art teaches cannot provide a suitable or useful support for a run flat system. Therefore, Applicant respectfully asserts that the claimed invention is nonobvious over the prior art.

Applicant respectfully asserts that all claims are now in condition for allowance and requests the timely issuance of the Notice of Allowance. If the Examiner believes that a telephone interview would expedite the examination of this pending patent application, the Examiner is invited to telephone the below signed attorney at the convenience of the Examiner. In the event there are any fees or charges associated with the filing of these documents, the Commissioner is authorized to charge Deposit Account No. 13-3085 for any necessary amount.

Respectfully submitted,



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